

We Claim:

- 1 1. A system for removing H_2S from methane (CH_4) which includes
2 providing at least one biofilter cartridge that functions to sustain microbial activity
3 that will function to consume H_2S contained in a stream of methane gas which
4 comprises establishing a stream of methane gas which contains H_2S and transporting
5 said methane gas stream directly into a biofilter system which contains at least one
6 cartridge containing selected microorganisms which function to biodegrade H_2S
7 followed by recirculating the treated methane to a storage reservoir or a source of
8 use.
- 1 2. The system of claim 1 in which the cartridge is positioned vertically
2 and water is circulated through the microorganisms.
- 1 3. The system of claim 1 where water is periodically flushed through the
2 microorganisms at a fast rate.
- 1 4. The system of claim 1 where said water is filtered, pH neutralized,
2 and recirculated.
- 1 5. The system of claim 1 where said water is filtered and neutralized
2 (pH).
- 1 6. The system of claim 1 in which the microorganisms are at least one
2 isolated from the group consisting of bacteria.
- 1 7. The system of claim 1 in which the cartridges are positioned
2 vertically and water is continuously trickled through the microorganisms.
- 1 8. The system of claim 2 in which the microorganism laden water film
2 is supported on a carrier material.

1 9. The system of claim 7 in which the carrier is at least one artificial
2 material selected from the group consisting of granular inert plastics.

1 10. The system of claim 7 in which the carrier is at least one artificial
2 material selected from the group consisting of granular materials.

1 11. The system of claim 7 in which the carrier is at least one material
2 selected from the group consisting of crystalline minerals.

1 12. The system of claim 7 in which the carrier or media consists of
2 perlite.

1 13. The system of claim 7 in which the carrier may include at least one
2 natural material selected from a group consisting of biodegradable media such as
3 compost, tree bark and vegetation.

1 14. A vertical reactor cartridge which comprises an outer housing having
2 a pair of oppositely disposed open ends, a housing which contains an inlet fan and an
3 inlet port connected to a vertical inlet tube positioned at one end extending through
4 center with said end further containing a water inlet and a gas outlet, and a water
5 reservoir attached to said opposite end, with said reservoir further containing an
6 outlet for the removal of water, where in operation, a source of methane which
7 contains H₂S to be treated is passed through said inlet and passed through a suitable
8 source of microorganisms contained in said housing which are selected to degrade
9 the H₂S, with said treated methane being released through said gas outlet.

1 15. A system for removing H₂S from methane which comprises:
2 (a) providing a reactor cartridge having an outer housing which contains a
3 gas, water inlets, outlets at opposite ends, a source of microorganisms contained
4 within said housing which are selected to degrade H₂S;

5 (b) passing a stream of methane which contains H_2S through said gas inlet
6 and through said microorganism contained in said housing whereby said H_2S is
7 degraded; and

8 (c) passing said treated methane through said gas outlet for storage or to a
9 source of use.

1 16. The system of claim 14 in which the reactor is cylindrical or generally
2 cubic in shape and positioned vertically in operation whereby the methane to be
3 treated is introduced into the reactor from the top through a vertical tube which
4 extends to the bottom which allows the H_2S containing methane to flow upwardly
5 through the microorganisms in the cartridge and out of the gas outlet at the top end
6 of said cartridge.

1 17. A system for removing H_2S from methane generated by animal waste
2 which comprises:

3 (a) providing a source of animal waste which generate a biogas which
4 contains a major portion of methane containing a relatively small amount of
5 hydrogen sulfide (H_2S);

6 (b) providing a reactor cartridge having an outer housing which contains a
7 gas inlet, water inlet and gas outlet at one end, and a source of microorganisms
8 contained within said housing which are selected to degrade H_2S ;

9 (c) passing a stream of said methane containing said H_2S through said gas
10 inlet and through said microorganism contained in said housing whereby said H_2S is
11 degraded;

12 (d) introducing a downward flow of flushable water, and

13 (e) passing said treated methane through said gas outlet for storage or to a
14 source of use.

1 18. The system of claim 14 in which the reactor is cylindrical or generally
2 cubic in shape and positioned vertically in operation whereby the methane to be

3 treated is introduced into the reactor from the top through a vertical tube which
4 allows the H₂S containing methane to flow upwardly through the microorganisms in
5 the cartridge and out of the gas outlet at the top end of said cartridge.

1 19. The system of claim 17 in which said animal waste comprises cow
2 manure.